

REMARKS

Claims 2-5, 10, 11 and 13 -15 were submitted for examination. In the Office Action, the Examiner: (a) allowed Claims 10, 11 and 13; (b) objected to Claims 10 and 14; and (c) rejected Claims 2, 4, 5, 14 and 15.

By this Reply paper: Claims 10 and 14 are amended. No claims are cancelled or newly added. Accordingly, upon entry of this Reply, Claims 2, 4, 5, 10-11, and 13 -15 are pending.

Following a final rejection, entry of responses are permitted which raise no new issues and/or place the application in condition for allowance or for appeal, such as by simplifying issues or accepting suggestions of the Examiner.

Claims 10 and 14 are amended in a manner suggested by the Examiner. Claim 14 is further amended in a manner to obviate a rejection based on 35 USC Section 112, wherein a limitation “adjusting means” is clarified to recite an “adjustment knob”. The further amendment to Claim 14 raises no new issues because such revision is essentially a rephrasing of a like limitation of “adjustment knob” found in Claim 15 and previously considered by the Examiner.

Entry of this Paper is believed appropriate as advancing the application and placing the application in condition for allowance, or placing the claims in condition for appeal.

Entry and reconsideration of this Application is requested.

The Office Action

A response to each Paragraph of the “Detailed Action” will follow and will be presented in the order presented in the “Detailed Action”.

Claim Objections

Claims 10 and 14 are objected to for reasons given.

Claims 10 and 14 are amended in a manner suggested by the Examiner.

Accordingly, the requested revisions obviate the Examiner's objections.

Claim Rejections – 35 USC § 112

Claims 2, 4-5 and 14 are rejected under 35 USC Section 112, second paragraph, as being indefinite. The Examiner draws attention to specific limitations of Claim 14 (e.g., line 6, “a load cell”, and lines 21-23, “wherein when the comparator generates a command signal ... the adjusting means increases or decreases the compressive force on the thread to adjust the tension in the thread as needed, and advises that the limitations are not compatible.

To clarify the invention, Claim 14 is revised as follows:

~~adjusting means~~ a manually operated adjustment knob, said knob being abutted against said force member and mounted for movement towards and away from said load cell for increasing or decreasing the compressive force applied by said force member against said load cell, ~~said adjusting means being in operable relation with said comparator means,~~ and

wherein when the comparator generates a command signal that the tension in the thread is not in conformance with the desired tension, ~~the adjusting means increases or decreases~~ adjustment knob is moved towards or away from the load cell to increase or decrease the compressive force of the clamping members on the thread to adjust the tension in the thread as needed.

The above amendment to Claim 14 is believed to clarify the invention and obviate any issue of indefiniteness under 35 USC Section 112, second paragraph.

Claims 2 and 4-5 are dependent on Claim 14 and are submitted as being definite for the same reason that Claim 14 is definite.

Claim Rejections – 35 USC Section 102

Claim 14 is rejected under 35 USC Section 102(b) as being anticipated by Rydborn (US-4,884,763)

Applicant's Attorney traverses the Examiner's rejection.

Claim 14 is directed to a thread tensioning apparatus for adjusting and monitoring the tension in a thread passing through a sewing machine during a stitching operation.

The Examiner contends that Rydborn discloses a thread tensioning apparatus for adjusting and monitoring the tension in a thread passing through a sewing machine.

Applicant's Attorney disagrees. Rydborn is directed to an apparatus for sensing thread movements and generating an electric signal corresponding to thread movement for indicating at least a signal loss. (See Rydborn, col. 1, lines 5-8, 30-32, and 40-43; col. 2, lines 3-9).

Rydborn is concerned with thread movement and a thread signal emitter apparatus therefor – not thread tension.

Rydborn does not show apparatus for adjusting and monitoring the tension in a thread and is not inherent in the thread signal emitter apparatus of Rydborn. Rydborn does not suggest or render obvious apparatus for adjusting and monitoring the tension in a thread. Indeed, Rydborn teaches away from monitoring or adjusting thread tension.

In describing drawbacks of textile machines and thread signal emitter apparatus to overcome these problems, Rydborn (col. 1, lines 13-26) teaches that it is necessary that the thread pass through a signal emitter, at a certain tension. However, Rydborn states that it is difficult to monitor angle deflections and tension influences and writes:

In order that the signal emitter be capable of generating a signal, it is necessary that the thread pass through the emitter at a certain tension and preferably also with a certain angle of deflection. However [thread tension] has proved difficult to monitor, in

addition to the previously prevailing angle deflections and tensions in the thread, further angle deflections and tension influences, to permit signal generation using per se conventional signal emitters of conventional different types.

SUMMARY OF THE INVENTION

The task forming the basis of **the present invention** is to realize **an apparatus for generating a signal in response to thread movements without giving rise to the above mentioned drawbacks.**

This task is solved according to the present invention in the apparatus disclosed by way of introduction, in that a transducer unit of the piezoelectric type is disposed in direct contact with an element included in the brake, this element being, either by the intermediary of further elements included in the brake, or directly, in contact with the thread which is to be braked and sensed in order that those movements which occur in the thread upon braking thereof shall be transmitted to the transducer unit”

In response to this problem, the Rydborn invention is a circuit for converting a signal corresponding to **thread movements** into a logic signal. (see FIG. 6, and Spec., col. 4, lines 47-49) A transducer unit senses movement of the thread during application of braking force to the thread by a brake element and provides an electric signal representative of a sensed movement indicating at least a signal loss, and thereby cessation of thread movement in the thread brake of the machine.

As such, Rydborn makes clear that his invention is directed to apparatus for generating a signal in response to thread movement, and senses or otherwise detects movement (i.e., motion or movement of thread), the result of losing such signal may be braking or stopping the machine. Rydborn accepts that the thread is under tension and has angular deflection, and acknowledges the problem and difficulties of monitoring these parameters. However, the Rydborn invention is concerned solely with sensing the movement of thread through the sewing machine.

Rydborn does not show, teach or suggest apparatus for continuously sensing, regulating, monitoring, and displaying the tensioning force in the thread as the thread moves through the sewing machine.

In contrast, independent Claim 14, and dependent claims thereof, and independent Claim 15 are directed, in part, to a thread tensioning apparatus for monitoring and adjusting the tension in a thread passing through a sewing machine during a stitching operation.

Claim 14 requires, inter alia,

“an electromechanical compression load cell disposed in contacting relation against one of said clamping members ... and operable under compression to generate an *output signal representative of* the compressive load placed on said load cell and the *tension in said thread*,

a comparator for receiving and comparing the output signal to a predetermined value representative of a desired thread tension and *providing a command signal* to indicate that the clamping pressure against the thread and thus *the tension in the thread is not in conformance with the desired tension*, - - -

a manually operated adjustment knob, said knob being abutted against said force member and mounted for movement towards and away from said load cell for increasing or decreasing the compressive force applied by said force member against said load cell, said adjusting means being in operable relation with said comparator means, and

wherein when the comparator generates a command signal that the tension in the thread is not in conformance with the desired tension, the adjustment knob is moved towards or away from the load cell to increase or decrease the compressive force of the clamping members on the thread *to adjust the tension in the thread as needed*.

In Rydborn, the output signal is representative of a sensed **movement** indicating at least a **signal loss** and thereby **cessation of thread movement** in the brake of the machine. In Rydborn, there is **no** measuring, monitoring, or adjustment of the **tension** in the thread – only the generating of a signal representative of the movement of the thread in the brake.

Accordingly, Claim 14 is not anticipated under 35 USC 102 in view of Rydborn because the Rydborn reference does not include each and every limitation required by the claim. Further, the limitations of Claim 14 are not inherent in the elements of Rydborn because Rydborn teaches against monitoring thread tensioning (as required by Claim 14).

Applicant’s Attorney submits that the rejection under 35 USC 102, based on Rydborn, should be withdrawn.

Applicant’s Attorney submits that Claim 14 is submitted is patentable over Rydborn and in condition for allowance.

Applicant's Attorney submits that Claims 2, 4, 5, each dependent on Claim 14, are allowable for the same reason that Claim 14 is allowable.

Claim Rejections - 35 USC 103

Claims 2, 4-5 and 15 are rejected under 35 USC 103 as being unpatentable over Rydborn in view of Yamazaki (US-6,595,150).

Applicant's Attorney traverses the Examiner's rejections.

Primarily, Rydborn renders the combination untenable. Because Rydborn is directed to sensing and displaying thread movement, or the lack thereof, and not thread tension, the combination with Yamazaki only adjusts the manner of signal display of thread movement. Either alone or in combination, the references do not show or teach adjustment or monitoring of thread tension.

Claims 2, 4, and 5 are dependent on Claim 14 and are submitted as being patentable for the same reasons given above that that Claim 14 is patentable. The combination of Rydborn and Yamazaki does not provide a thread tensioning apparatus for adjusting and monitoring the tension in thread passing through a sewing machine during a stitching operation, and does not provide the thread tensioning apparatus as required in the respective of Claims 2, 4 and 5. Rydborn is only concerned with thread movement, not thread tension. That the thread may be under a certain tension, Rydborn does not teach the monitoring or adjustment thereof. Yamazaki is directed to a data display unit and is not concerned with thread tension.

Accordingly, Applicant's Attorney submits that Claims 2, 4, and 5 are patentable over the above combination of references to Rydborn and Yamazaki.

The same arguments given above in regards to Claim 14, as applied to Rydborn, apply with equal force to Claim 15.

Claim 15 is directed to a tensioning device for a sewing machine for monitoring and adjusting the tension in a thread passed through the machine during a stitching operation, which comprises:

“a ring shaped electromechanical load cell, ---, said load cell, when compressed, being operable to generate an output signal representative of the amount of *tension placed on the thread*, and means for receiving and displaying said output signal.”

This requirement of Claim 15 is not shown or suggested in Rydborn. Indeed, Rydborn acknowledges the difficulty in monitoring thread tension and deflection and thus teaches that the thread movement be sensed and monitored. Rydborn teaches away from the invention required by Claim 15.

Claim 15 further requires:

an adjustment knob threadably connected to the distal end of said support shaft, ... , movement of said knob towards said support wall driving said spring and said disc members against the load cell and compressing said load cell, said load cell, when compressed, being operable to generate an output signal representative of the amount of tension placed on the thread.

Rydborn does not relate to measurement, monitoring and adjustment of thread tension.

As such, the requirement of Claim 15 of an adjustment knob to compress elements against a load cell to generate an output representative of thread tension is not suggested by Rydborn.

Yamazaki, as noted, is directed to a display unit, and has no bearing on thread tension.

Accordingly, Applicant's Attorney submits that Claim 15 patentably defines over the prior art and is in condition for allowance.

Conclusion

Claims 10, 11, and 13 are allowed.

Claims 10 and 14 are amended to remove objections.

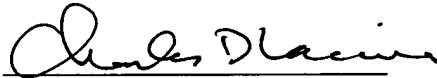
Certain rejections under 35 USC Section 112, second paragraph, Section 102, and Section 103, are believed obviated, either by the amendment of Claim 14 herein, or in view of arguments presented.

Claims 2, 4, 5, 10, 11, and 13-15, all claims pending in this application, are submitted as being patentable and in condition for allowance.

A Notice of Allowance is requested.

If the Examiner believes that a telephone conference would advance the prosecution of this application, he is encouraged to contact counsel for Applicant at the number listed below.

Respectfully submitted,



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Date: Fri May 12, 2006